DOCUMENT RESUME

ED 333 989 PS 019 639

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TITLE Self-Regulation Training and Private Speech in Impulsive Preschoolers.
PUB DATE Apr 91
NOTE 13p.; Project was supported by a grant from the Stanford Schools Collaborative.
PUB TYPE Reports - Research/Technical (143) -- Speeches/Conference Papers (150)

EDRS PRICE MF01/PC01 Plus Postage.
DESCRIPTORS Comparative Analysis; *Conceptual Tempo; Difficulty Level; Performance Factors; *Preschool Children; Preschool Education; Pretests Posttests; *Self Control; *Speech Habits; *Training
IDENTIFIERS *Private Speech; *Self Regulation

ABSTRACT

On the basis of teachers' ratings of impulsivity, a group of 20 preschool children with a mean age of 51 months were assigned to groups of impulsive and non-impulsive subjects. Both groups were administered two measures of impulsivity as pre- and posttests: the Draw-a-Line Test and an adapted version of the Matching Familiar Figures Test. In addition, children were videotaped in pre- and posttest sessions while independently completing a selective attention task. Impulsive children participated in 15 training sessions, each of 15 minutes duration, that were designed to promote the effective use of spontaneous private speech during goal-directed activity. The effective use of private speech was facilitated through sensitive increases of task difficulty and contingent withdrawal of trainer control. Children's private speech and degree of impulsivity were assessed. Findings indicated that impulsive children emitted higher amounts of private speech before training, especially self-verbalizations typically considered "immature," such as descriptions of self and environment. Training reduced the amount of both low-level and total private speech emitted by the impulsive preschoolers. No effects of training were found on the laboratory measures of impulsivity. (Author/RH)

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Self-Regulation Training and Private Speech in Impulsive Preschoolers

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PS 01639

Presented at the biennial meeting of the Society for Research in Child Development, Seattle WA, April 1991.

This project was generously supported by a grant from the Stanford Schools Collaborative. We would very much like to thank the director - Rachel Samoff, the teachers, the families, and the children of the Children's Preschool Center, Palo Alto, CA.
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ABSTRACT

On the basis of teachers' ratings of impulsivity, 20 preschoolers were assigned to groups of impulsive and non-impulsive children. Impulsive children participated in fifteen, 15-minute training sessions designed to promote the effective use of spontaneous private speech during goal-directed activity. The effective use of private speech was facilitated through sensitive increases of task difficulty and contingent withdrawal of trainer control. Children's private speech and degree of impulsivity were assessed at pre- and post-training. Impulsive children emitted higher amounts of private speech before training, especially self-verbalizations typically considered "immature", such as descriptions of self and environment. Training reduced the amount of both low-level and total private speech emitted by the impulsive preschoolers. No effects of training were found on the laboratory measures of impulsivity.

INTRODUCTION

During the past twenty years, inspired by the seminal work of Meichenbaum & Goodman (1971), a substantial number of researchers and clinicians have trained children who exhibit a wide range of learning and behavior problems in the use of self-regulatory verbalizations. The rationale for this type of self-instructional training can be stated as follows: If normal children rely on self-talk to plan, guide, and monitor their own activity in a self-regulated manner, then children who exhibit problems in self-control such as impulsivity, distractibility, or hyperactivity, could benefit from training in the use of private speech. Unfortunately, self-instructional training, as currently implemented, has not proven effective as a tool to decline impulsivity or increase self-regulatory skills and behaviors (see reviews by Abikoff, 1985; Dush, Hirt, & Schroeder, 1989).

Self-instructional training programs have assumed that children with self-control problems have a lack or a deficient/immature use of private speech. Further, the training assumes that modelling the use of private speech in an experimental setting will increase children's spontaneous use of private speech across different settings. These two assumptions have been questioned by current research on private speech.

First, impulsive, inattentive, and hyperactive children emit more private speech than their normal counterparts and their private speech is task-relevant and increases normally on difficult tasks (Berk & Potts, in press; Diaz & Lowe, 1987).

Second, research on mother-child teaching interactions has shown that the spontaneous use of private speech emerges not through the modelling or imitating of adults' self-verbalizations, but rather appears in situations where difficult tasks challenge children's automatized performance and there is a contingent decline in external sources of direction and regulation (Diaz, Neal, & Amaya-Williams, 1990; Diaz, in press).

An additional problem is that few self-instructional training studies have assessed the impact of training on children's spontaneous use of private speech after training.

PURPOSE

1) The study assessed differences between impulsive and non-impulsive children in their spontaneous use of private speech on a cognitive task.

2) The study trained impulsive children in the use of private speech, employing an alternative treatment than modelling self-verbalizations. The treatment, described in detail below, created situations known to increase children's use of private speech in natural situations (i.e., tasks of increasing difficulty and contingent declines in adult control).

3) The study assessed the impact of training on children's spontaneous use of private speech.

4) The study assessed the impact of training on several measures of impulsivity.

HYPOTHESES

A) At pre-test, the impulsive children will use more private speech overall than the non-impulsive children.

B) At pre-test, the impulsive children will exhibit more immature or low-level private speech than the non-impulsive children.

C) After the training, the impulsive group's immature private speech will be reduced.

D) As a result of the training, the impulsive children will show improvement on the laboratory-type measures of impulsivity.

METHOD

SUBJECTS

• 20 children (16 male, 4 female) from two preschool classes in a corporate sponsored child care center in the San Francisco Bay area served as subjects for the study. The age range of the children was 36-69 months, with a mean age of 51 months.

PROCEDURE

• Twelve of the preschoolers (10 boys, 2 girls) were selected for the impulsive (treatment) group on the basis of teacher ratings on a behavioral scale of impulsivity and eight children were randomly selected from the rest of the preschoolers to serve as a control group.

• Both groups were administered two laboratory-type measures of impulsivity, the Draw-A-Line Test and an adapted-for-preschool version of the Matching Familiar Figures Test at pre-test and at post-test. In addition, the children were videotaped while independently completing a cognitive (selective attention) task at pre- and post-test. This particular task has previously been found to be a good elicitor of spontaneous private speech with children of this age (Diaz, Neal, & Vachio, 1991).

• The children in the impulsive group received fifteen, 15-minute individual trainings sessions (**see the description of training**) with one of two trainers, over the course of 6 weeks. Children in the control group received no intervention.

DESCRIPTION OF TRAINING

The alternative training procedures employed in this study are based on the following two assumptions:

1) Impulsive children already possess a wide range of verbal strategies that, in content and timing, have the potential to regulate their behavior. Training, therefore, should focus on providing repeated opportunities for them to use their existing private speech effectively, rather than on modeling strategies they already possess.

2) Training procedures should re-create situations similar to the natural situations already shown to elicit a maximum amount of private speech.

Research to date shows that private speech can be elicited reliably by using tasks of medium difficulty, that is, neither too easy nor beyond the child's capacity. As long as the task offers an age-appropriate demand for executive functioning, the use of private speech should be expected. Private speech production can also be increased by the presence of others, only if such presence is not controlling, a situation which would diminish a child's need for self-regulation. Thus, the presence of a scaffolding adult, where the adult dynamically and contingently brings a difficult task within range of the child's potential mastery, is the most conducive social context to elicit children's use of self-regulatory language.

Trainers were instructed to implement the following procedures:

• Trainers engaged the children in goal-directed activity, using a variety of educational toys which involved the construction of three-dimensional arrays according to pictured models. The task and goal (model) were selected by the child from a set of possibilities tacitly structured by the trainers.

• If the children worked toward the goal steadily, easily, and without self-verbalizations, the trainers were asked to increase the difficulty of the task. If the children were engaged in self-talk, directing their activity, the trainers were asked to remain silent and not intervene.

• If the children were distracted or off-task, trainers were instructed to help the children return to the task in the least controlling manner possible.

• The children were encouraged to do as much of the task as they could on their own. If the children asked for help, the trainers would first wait to see if they would solve the problem on their own, and then assist -- again in the least direct or controlling way as possible.

The training was designed to provide a dynamic and contingent window of opportunity, a ZONE OF EXECUTIVE FUNCTION (ZEF), where children were given the opportunity to direct their own activity with self-verbalizations as they worked toward a pre-specified goal. The window, or ZEF, was contingently and dynamically adjusted so that each child could have maximum opportunity for verbal self-direction.

PRIVATE SPEECH CODING

Children's pre/post-test sessions were videotaped and verbalizations during the cognitive task were transcribed. Speech was classified as either private or social. Private speech was defined as any utterance emitted by the child which was not explicitly addressed to another person as indicated by either a social gaze (during, or immediately before or after the utterance) or an obvious pronoun reference ("Which one, David?"). All instances of private speech were then coded into one of the following ten mutually exclusive categories based on the coding system used by Copeland (1979):

1. **Exclamations**: excitement words, e.g., "Oh!" - "Oops!" - "Ahh!".
2. **Nonwords:** humming, vocal sounds, often accompanying motion, e.g., "Hmmm" - "Blappptttt!" - "nnnnn".
3. **Descriptions of Self:** Describing the child's own behavior, e.g., "I'm looking for blue" - "I found a fish".
4. **Descriptions of Environment:** Describing surroundings, including the game, e.g., "No more orange" - "They're the same" - "Two cars".
5. **Self-reinforcement:** self-praising statements, positive feedback, e.g., "I got it!" - "I can do anything in the whole world" - "Good".
6. **Planning:** intentions or future oriented statements preceding action, e.g., "I need to find a purple" - "I'll pick the car" - "I need a chicken".
7. **Commands:** instructions to the self, e.g., "Pick them up!" - "Don't put a blue spot" - "Get one more".
8. **Questions:** questions addressed to the self either answered by themselves or unanswered, e.g., "Which one?" - "Where's blue?" - "What?".
9. **Inaudible Mutterings:** vocal sounds accompanied by lip movements, clear mouthing of words too soft to hear or unintelligible.
10. **Other:** Anything that could not be placed in the above categories, e.g., "O.K." - "There" - "Yes".

Consistent with the developmental hierarchy proposed by Kohlberg, Yaeger, and Hjertholm (1968), the above categories of private speech were divided into two classes - Immature (low-level) and Mature (high-level):

Immature Private Speech (Kohlberg et al.'s Level I & II - "Presocial self-stimulating language" & "Outward-directed private speech")	**Mature Private speech** (Kohlberg et al.'s Level III & IV - "Inward-directed, self-guiding private speech" & "External manifestations of inner speech")
Exclamations Nonwords Descriptions of Self Descriptions of Environment Self-reinforcements	Plans Commands Questions Inaudible Mutterings

RESULTS

1) At pre-test, the impulsive children used more overall private speech than the non-impulsive children.

2) At pre-test, the private speech of the impulsive group was characterized by a greater amount of immature, low-level verbalizations, compared to the control group.

3) After training, there were no differences between the two groups in the quantity of immature, mature or total private speech.

4) Controlling for the effects of initial impulsivity status, the impulsive children's immature and total private speech were reduced as a result of the treatment.

5) The laboratory measures of impulsivity (Draw-a-Line & MFFT) did not distinguish between the two groups at pre-test, nor did they correlate with themselves over time, with each other, with the teacher ratings, or with private speech. No improvement on these measures for the treatment group was observed.

TABLE

Means (and Standard Deviations) of the Number of Private Speech Utterances During the Selective Attention Task at Pre-test and Post-test, by Impulsivity Group

		Pre-test		Post-test		F^a Group Difference Pre-test	F^a Group Difference Post-test	F^b Group by Time Interaction
		Impulsive Group	Non-Impulsive Group	Impulsive Group	Non-Impulsive Group			
Total Private Speech	M	21.75	9.88	16.17	17.25	2.75	< 1	2.40
	SD	(18.83)	(8.66)	(10.71)	(20.70)			
Immature Private Speech	M	14.0	6.38	9.5	10.5	3.84*	< 1	3.97*
	SD	(9.94)	(5.63)	(6.53)	(14.08)			
Mature Private Speech	M	6.83	3.00	5.25	5.88	1.18	< 1	< 1
	SD	(9.57)	(3.16)	(4.27)	(7.18)			

[a] One-way univariate ANOVA by group (n=20, df = 1,19)

[b] The effects of treatment were assessed by examining the group by time interaction of one-way univariate ANCOVAS (n=18, df = 1,17), with times as a within-subjects factor. As suggested by Campbell and Stanley (1963) for the analysis of non-equivalent treatment and control groups, ANCOVAS were conducted, covarying initial teacher-ratings of impulsivity.

* ($p < .07$)

CONCLUSIONS

1) Impulsivity, as an index of disregulation of the motor and attentional systems, demands an increased amount of self-regulatory effort to meet the demands of goal-oriented activity. The high incidence of private speech in impulsive children is a manifestation of their genuine and effortful attempts at self-regulation.

2) At this time, however, it is not clear why the private speech of impulsive preschoolers, emitted in substantial amounts during problem solving-tasks, does not result in more regulated and reflective patterns of behavior. It is possible that, beyond a given threshold of impulsivity and inattention, private speech looses its effectiveness in regulating ongoing activity.

3) Impulsive children display greater amounts of private speech that is considered "low level" or "immature," especially speech that accompanies (e.g., descriptions of self) rather than precedes (e.g, planning) action. Investigators in the past, therefore, have concluded that impulsivity may be the result of private speech immaturity. An alternative explanation is that high levels of impulsivity require stronger sources of regulation, such as that provided by overt descriptions of self and environment. In normal children, overt verbalizations that accompany activity perform important attention-focusing functions.

4) When impulsive children are given the opportunity to use their private speech effectively, as within the context of our intervention, the overall amount of private speech, and of self-descriptions in particular, diminishes over time to the normal levels of private speech found in non-impulsive children. This finding suggests that the effective use of private speech in the context of scaffolding interventions leads to more regulated patterns of behavior and attention, decreasing the need to accompany activity with overt attention-focusing verbalizations.

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